

CLOUD COMPUTING & SECURITY -A PRACTICAL APPROACH



ORGANIZED BY

राष्ट्रीय इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी संस्थान, गोरखपुर
National Institute of Electronics and Information Technology (NIELIT)
Gorakhpur
An Autonomous Scientific Society of Ministry of Communication &
Information Technology,
Department of Electronics & Information Technology (DeitY)
Govt. of India
M. M. M. University of Technology, Gorakhpur U.P.– 273010
Web : <http://gorakhpur.nielit.gov.in>

Training Objectives:

Cloud Computing is one of the most advanced technology in the IT sector. Cloud Computing is going to create lots of jobs in the market in the coming years.

The companies in Cloud Computing offer their services on three models.

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)
- DaaS (Desktop as a Service)
- VDI (Virtual Desktop Infrastructure)

This course focuses on concepts of cloud, fundamental building blocks like Resource Consolidation, Hypervisor, VM etc. and specially cloud as IaaS (Infrastructure as a service). It gives students the insight into how to build clouds. And provides practices on building the cloud. It also gives exposure to Public and Privacy Clouds. It gives students the future directions in cloud domain.



At the end of the Cloud Computing course, participants would be able to –

- Gain knowledge of Cloud as PaaS,IaaS,SaaS
- Work in cloud environment
- Build their own cloud
- Take up role of Cloud Consultant
- Understand Virtualization, HA, DR planning etc.
- Help their organisation reduce Total Cost of Operation
- Help increase in organization ROI (Return on Investment)
- Help companies and organizations secure their cloud computing platforms

Duration/Fee/Eligibility

Course Fee*	Rs 11,000=00* (For Primary Module)	
Eligibility	B.TECH. (CS/IT/EC)or MCA/M.Sc. (IT/CS/ Electronics), BCA/PGDCA, Diploma in Computer/Electronics Stream, B.Sc. or B.A with basic knowledge in Linux, Programming & Networking, A/B/C Level, Working Professional in same domain.	
Duration	6 Weeks (90 Hours)	Rs 3000.00/ 2 Weeks Extra for Additional Module (See Annexure-I)
Starting Date	12 January 2015	
Seats	30	
Reservation for SC/ST as per Govt of India Norms. Tuition/Examination fee for SC/ST(for all Courses): NIL		

Pre-requisite

Candidate must have good understanding in the area of Networking and Windows Linux Basic Skills

How to Apply:

For Admission, submit application form along with fee (either in Cash or Demand Draft in favour of “**NIELIT, Gorakhpur**”).

The application form may be downloaded from our website or collected from reception.

Accommodation:

Hostel accommodation is available for Male candidates only.

Training Highlights

- Well Managed Course pattern
- Daily Handouts & Lab Exercise
- Industry Compliant Syllabus
- Use of Latest Tools & Technology
- LAB Assistance

Course Contents

Introduction to Cloud Computing

What is cloud? ,Services provided by cloud are categorized :Software As a Service(SaaS) ,Infrastructure As a Service(IaaS) ,Platform As a Service(PaaS) ,Desktop As a Service (DaaS) and VDI etc.

How Cloud Computing Works, Advantages & Disadvantages, Applications for Businesses Cloud Service Providers,

Brief overview of major Cloud Service providers – Amazon AWS, Google App Engine, Microsoft, VMware.

How Companies are using Cloud Computing

Cloud Computing Risks and Issues

Virtualization

Virtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS (Hypervisor), HA/DR using Virtualization

Live Migration of VMs, SAN backend concepts, S/W defined Networking (OpenFlow/OpenVSwitch), S/W Defined Datacenter, S/W Defined Storages.

Virtualization for Enterprise

- Vmware
- Xen
- KVM with oVirt
- Hyper-V

Building Cloud Networks

Designing and Implementing a Data Center-Based Cloud, Industry and International Standards

Communication Requirements for Cloud Implementation

Private , Public & Hybrid Clouds

What is Private, Public & Hybrid Clouds, and Advantages & Disadvantages? On Premises and Off Premises Cloud services, installing a Cloud service using

- Eucalyptus
- Open Nebula
- Open Stack

Amazon Web Services

Microsoft Azure

Google App Engine

VMware air

Setting up your own Cloud

How to build private cloud using open source tools

Understanding various cloud plugins, Setting up your own cloud environment

Autoprovisioning

Custom images

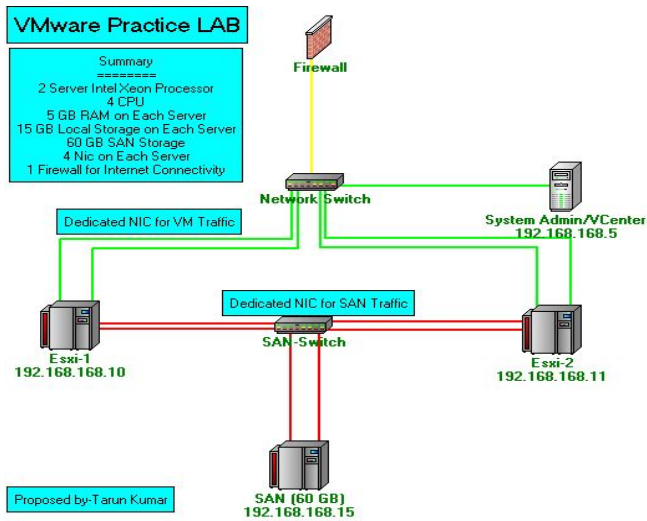
Integrating tools like Nagios

Cloud Security

- Infrastructure Security
- Network level security, Host level security, Application level security
- Data security and Storage
- Data privacy and security Issues, Jurisdictional issues raised by Data location
- Identity & Access Management
- Access Control
- Trust, Reputation, Risk
- Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business consideration

Project Work

- Designing of sample cloud services.
- Case Study of sample cloud services.



Overview:

In this hands-on course you explore the installation, configuration, and management of VMware vSphere®, which consists of VMware ESXi™ and VMware® vCenter Server™. This course is based on versions of ESXi 5.5 and vCenter Server 5.5.

Who Should Attend?

This course is ideal for System administrators, Systems engineers, and Operators of ESXi and vCenter Server

Prerequisite(s) or Equivalent Knowledge:

Should have: - System administration experience on Microsoft Windows or Linux operating systems. -

Course Contents

1	Course Introduction <ul style="list-style-type: none"> • Introductions and Course objectives
2	Virtualized Data Center <ul style="list-style-type: none"> • Introduce components of the virtualized data center • Describe where vSphere fits into the cloud architecture • Install and use vSphere Client
3	Creating Virtual Machines <ul style="list-style-type: none"> • Introduce virtual machines, virtual machine hardware, and virtual machine files • Deploy a single virtual machine
4	VMware vCenter Server <ul style="list-style-type: none"> • Introduce the vCenter Server architecture • Introduce VMware vCenter Single Sign-On™ • Install and use vSphere Web Client •• Configure and manage vCenter Server Appliance • Manage vCenter Server inventory objects and licenses
5	Configuring and Managing Virtual Networks <ul style="list-style-type: none"> • Describe, create, and manage a standard switch • Describe and modify standard switch properties • Configure virtual switch load-balancing algorithms
6	Configuring and Managing Virtual Storage <ul style="list-style-type: none"> • Introduce storage protocols and device names • Configure ESXi with iSCSI, NFS, and Fibre Channel storage • Create and manage vSphere datastores
7	Virtual Machine Management <ul style="list-style-type: none"> • Use templates and cloning to deploy virtual machines • Modify and manage virtual machines • Create and manage virtual machine snapshots • Perform vSphere vMotion and vSphere Storage vMotion migrations • Create a VMware vSphere vApp
8	Access and Authentication Control <ul style="list-style-type: none"> • Control user access through roles and permissions • Configure and manage the ESXi firewall
9	Resource Management and Monitoring <ul style="list-style-type: none"> • Introduce virtual CPU and memory concepts • Describe methods for optimizing CPU and memory usage • Configure and manage resource pools • Monitor resource usage using vCenter Server performance graphs and alarms
10	High Availability and Fault Tolerance <ul style="list-style-type: none"> • Introduce the new vSphere High Availability architecture • Configure and manage a vSphere HA cluster Industry Leading VeemOne & VeemBackup Solution • Introduce vSphere Fault Tolerance
11	Scalability <ul style="list-style-type: none"> • Configure and manage a VMware vSphere Distributed Resource Scheduler (DRS) cluster • Configure Enhanced vMotion Compatibility • Use vSphere HA and DRS together
12	Patch Management <ul style="list-style-type: none"> • Use vSphere Update Manager to manage ESXi patching • Install vSphere Update Manager and the vSphere Update Manager plug-in • Create patch baselines • Scan and remediate hosts
13	Installing VMware Components <ul style="list-style-type: none"> • Introduce ESXi installation • Introduce vCenter Server deployment options • Describe vCenter Server hardware, software, and database requirements • Install vCenter Server (Windows-based)

HYPER-V Lab (Optional)

Overview:

In this hands-on course you explore the installation, configuration, and management of *Hyper-V*. The participant would learn how to configure key Microsoft Server Virtualization features such as Generation 2 Virtual Machines, Replication Extension, Online Export, Live Migration, Online VHDX Resizing, etc.

Who Should Attend?

This course is ideal for System administrators, Systems engineers.

Prerequisite(s) or Equivalent Knowledge:

Should have: - System administration experience on Microsoft Windows or Linux operating systems. -

Duration: 2 Weeks

Fee: Rs 3000.00

Course Contents

S.No	Details
1	<p><i>Configure Hyper-V</i></p> <ul style="list-style-type: none"> • Create and configure virtual machine settings. • Create and configure virtual machine storage. • Create and configure virtual networks.
2	<p><i>Configure and Manage Virtual Machine High Availability</i></p> <ul style="list-style-type: none"> • Configure failover clustering with Hyper-V. • Manage failover clustering roles. • Manage virtual machine movement.
3	<p><i>Implement a Server Virtualization Infrastructure</i></p> <ul style="list-style-type: none"> • Implement virtualization hosts. • Implement virtual machines. • Implement virtualization networking. • Implement virtualization storage. • Manage and maintain a server virtualization infrastructure.
4	<p><i>Monitor and Maintain a Server Virtualization Infrastructure</i></p> <ul style="list-style-type: none"> • Plan and implement a monitoring strategy. • Plan and implement a business continuity and disaster recovery solution. • Industry Leading VeeamOne & VeeamBackup Solution

Open Source Red Hat Enterprise Virtualization (OPTIONAL)

Overview:

In this hands-on course you explore the installation, configuration, and management of Red Hat Enterprise Linux Virtualization.

It is a hands-on training course that explores the virtualization features of Red Hat Enterprise Linux with the advanced Red Hat Enterprise Virtualization platform. Students acquire the skills and knowledge to deploy and centrally manage virtual servers and virtual desktops in the enterprise. Upon completion of RH318, students will have the skills and knowledge to effectively create, deploy, manage, and migrate Linux and Microsoft® Windows® virtual machines hosted on either RHEV Hypervisor .

Who Should Attend?

This course is ideal for System administrators, Systems engineers.

Prerequisite(s) or Equivalent Knowledge:

Should have: - System administration experience on Linux operating systems. -

Duration: 2 Weeks

Fee: Rs 3000.00

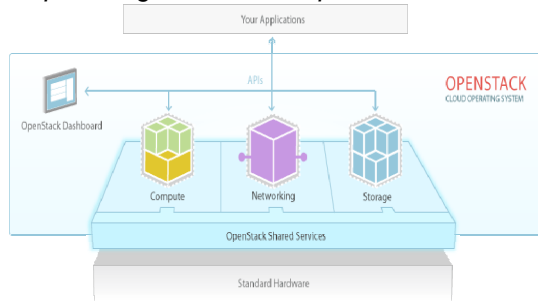
Course Contents

- **Red Hat Enterprise Virtualization overview**
Understand general virtualization, KVM concepts, and Red Hat® Enterprise Virtualization platform.
- **Red Hat Enterprise Virtualization Manager**
Install, test, remove, and troubleshoot Red Hat Enterprise Virtualization Manager.
- **Red Hat Enterprise Virtualization Hypervisor**
Install, configure, upgrade, and troubleshoot Red Hat Enterprise Virtualization Hypervisor.
- **Red Hat Enterprise Virtualization environment configuration**
Create and configure datacenters, clusters, storage domains, and logical networks.
- **Red Hat Enterprise Virtualization for Servers**
Install, perform basic management of, and troubleshoot virtual servers and images.
- **Red Hat Enterprise Virtualization for Desktops**
Install virtual desktops and configure paravirtualized drivers.
- **Virtual machine templates**
Create Microsoft Windows and Red Hat Enterprise Linux® virtual machines with template images.
- **Pools and users**
Use pools and deploy the user portal with multilevel administrative roles.
- **Monitoring and reports**
Monitor Red Hat Enterprise Virtualization and create custom reports.
- **Advanced Red Hat Enterprise Virtualization**
Back up and restore Red Hat Enterprise Virtualization; CLI and API interfaces.
- **Red Hat Enterprise Linux hosts**
Manage virtual machines with Red Hat Network.
- **Migration and high availability**
Migrate a virtual machine and explore high availability
- **Comprehensive review**
Apply the performance objectives learned throughout the course

OpenStack (OPTIONAL)

Overview:

OpenStack is a cloud operating system that controls large pools of compute, storage, and networking resources throughout a datacenter, all managed through a dashboard that gives administrators control while empowering their users to provision resources through a web interface.



In this hands-on course you explore the installation, configuration, and management of cloud through OpenStack.

Who Should Attend?

This course is ideal for System administrators, Systems engineers.

Prerequisite(s) or Equivalent Knowledge:

- Should have: - System administration experience on Linux operating systems.
- The candidates should have intermediate knowledge of Linux, Networking, Virtualization.
- Some familiarity with Virtual Box is recommended.
- Knowledge of Terminal Based Text editors like vi or nano or vim is necessary.

Duration: 2 Weeks

Fee: Rs 3000.00

Course Contents

- Overview and Stats of OpenStack, Project, Community and Foundation
- Basic overview of core OpenStack components (Compute, Block, Network, Dashboard)
- Introduction to various Projects under OpenStack
 - OpenStack Compute (Nova)
 - OpenStack Networking (Neutron)
 - OpenStack Identity (Keystone)
 - OpenStack Block Store (Cinder)
 - OpenStack Dashboard (Horizon)
 - OpenStack Image (Glance)
 - OpenStack Infrastructure, etc.
- End-User Tasks
 - Deploy applications to OpenStack clouds
 - Deep dive into various OpenStack components including new and incubated projects
 - Software Defined Networking with OpenStack
- Network As A Service, Security and Firewalls.
- How to create complicated network topologies using OpenStack Neutron
- Leverage advanced application topologies
 - Operate and manage projects and elements via Horizon, and OpenStack CLI
- Making your Private Cloud into Hybrid Cloud
 - with NIELIT-DATACENTER

Labs & Demos

- Deploy OpenStack Single Node with
 - OpenStack Compute (Nova)
 - OpenStack Networking (Neutron)
 - OpenStack Identity (Keystone)
 - OpenStack Image (Glance)
 - OpenStack Block Store (Cinder)
 - OpenStack Dashboard (Horizon)

- Getting Familiar with End-User/ Cloud Operator Tasks (Lab and Demo)
 - Create an instance using API and Dash
 - Understand conf and log files
 - Understand basics of APIs and framework architecture
 - Understand shared components
 - Work off a single node openstack implementation
- Advanced Neutron
 - Network As A Service, Security and Firewalls.
 - Able to create complicated network topologies using OpenStack Neutron
 - Able to leverage advanced application topologies

CONTACT INFORMATION:

Abhinav Mishra

Scientist C

7752997204

abhinav@nielit.gov.in

Instructors

Tarun Kushwaha (System Admin)

Project Associate

7619864568

Pawan Mall (Programmer)

Project Associate

9450891658

Rahul Sisodia (System Admin)

Project Associate

ADDRESS FOR CORRESPONDENCE:

IT DIVISION

National Institute of Electronics and Information Technology (NIELIT) Gorakhpur

M. M. M. University of Technology,

Gorakhpur (UP) – 273010.

Phone: 0551-2273874

Fax: 0551-2273873